STUDY OF IMPLEMENTING OF SAFETY INSPECTION DRONES POWERED WITH A DEEP LEARNING ALGORITHM TO ENHANCE SAFETY IN SRI LANKAN CONSTRUCTION SITES

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ABSTRACT

Most of the construction sites in Sri Lanka are in under unsafe conditions, due this unsafe condition valuable human lives in danger state and many pays from their lives every year. The construction industry holds a major position in development process of Sri Lanka. It significantly contributes for not only Gross Domestic Product but also in Gross National Product. While it is holding a major rank for developing economy, unfortunately Health and Safety factor becomes a secondary concern. The traditional inspection methods currently practising in the industry are seems to be outdated, time consuming, less efficient, less effective and increase the workload on Safety Officers. It is impossible to perform observation in multiple location in same time by a single Safety Officer, some locations in sites are hard to reach and there may be blind spots too. This study proposing an automated safety inspection method to increase the current safety levels of construction sites. For this instance, study reveals a comprehensive experimental discussion on how to blend image processing techniques with unmanned aerial vehicles together. Image processing is the technical analysis of images by using complex algorithms, in this scenario unmanned aerial vehicles (drones-quadcopters) act as a flexible image providing source that can fly over the construction sites by providing real time videos for the algorithm to analyse for safety hazards. The study was concluded by achieving four objectives, developing an algorithm with YOLO v3 architecture to detect safety hazards through drones, measure the accuracy and reliability of the automated detections, identify and propose a proper inspection protocol while employing the drone and finally identify and ranking the common barriers that may disrupt when implementation process in construction sites.

Key words: *Construction safety, Image processing, Unmanned aerial vehicles*